SEQUENCE LISTING

<110> FIEBIG, HELMUT
NANDY, ANDREAS
CROMWELL, OLIVER

<120> DNA SEQUENCE, AND RECOMBINANT PREPARATION OF THE GRASS POLLEN ALLERGEN LOL P 4

<130> MERCK-3179

<140> 10/583,093
<141> 2006-06-15

<150> PCT/EP04/013663
<151> 2004-12-01

<150> DE 103 59 352.7
<151> 2003-12-16

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<170> PatentIn Ver. 3.3

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ggc ggg cac gac tac gag ggc ctc tcg tac cgc tcc ctg cag ccc gag   97
Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu Gln Pro Glu
            20                  25                  30

aac ttc gca gtc gtc gac ctc aac cag atg cgg gcg gtg ttg gtg gac   145
Asn Phe Ala Val Val Asp Leu Asn Gln Met Arg Ala Val Leu Val Asp
         35                  40                  45

ggt aag gcc cgc acg gcg tgg gtc gac tcc ggc gcg cag ctc ggc gag   193
Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln Leu Gly Glu
     50                  55                  60

ctc tac tac gcc atc tcc aag tat agc cgc acg ctg gcc ttc ccg gca   241
Leu Tyr Tyr Ala Ile Ser Lys Tyr Ser Arg Thr Leu Ala Phe Pro Ala
 65                  70                  75                  80

ggc gtt tgc ccg acc atc ggc gtg ggc ggc aac ctc gcg ggc ggc ggc   289
Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Leu Ala Gly Gly Gly
                85                  90                  95
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ttc ggt atg ctg ctg cgc aag tac ggc atc gcc gca gag aac gtc atc   337
Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu Asn Val Ile
            100                 105                 110

gac gtg aag ctc gtc gac gcc aac ggc aag ctg cac gac aag aag tcc   385
Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp Lys Lys Ser
        115                 120                 125

atg ggc gac gac cat ttc tgg gcc gtg agg ggt ggc ggc ggc gag agc   433
Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly Gly Glu Ser
    130                 135                 140

ttc ggc atc gtg gtc tcg tgg cag gtg aag ctc ctg ccg gtg cct ccc   481
Phe Gly Ile Val Val Ser Trp Gln Val Lys Leu Leu Pro Val Pro Pro
145                 150                 155                 160

acg gtg acc atc ttc aag atc ccc aag tca gtc agc gag ggc gcc gtg   529
Thr Val Thr Ile Phe Lys Ile Pro Lys Ser Val Ser Glu Gly Ala Val
                165                 170                 175

gac atc atc aac aag tgg caa ctg gtc gcg cct caa ctt ccc gcc gac   577
Asp Ile Ile Asn Lys Trp Gln Leu Val Ala Pro Gln Leu Pro Ala Asp
            180                 185                 190

ctc atg atc cgc atc att gcg atg ggg ccc aag gcc acg ttc gag gcc   625
Leu Met Ile Arg Ile Ile Ala Met Gly Pro Lys Ala Thr Phe Glu Ala
        195                 200                 205

atg tac ctc ggc acc tgc aaa acc ctg acg ccg atg atg cag agc aag   673
Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Met Met Gln Ser Lys
    210                 215                 220

ttc ccc gag ctt ggc atg aac gcc tcg cac tgc aac gag atg tca tgg   721
Phe Pro Glu Leu Gly Met Asn Ala Ser His Cys Asn Glu Met Ser Trp
225                 230                 235                 240

atc gag tcc atc ccc ttc gtc cac ctc ggc cat agg gat tcc ctg gag   769
Ile Glu Ser Ile Pro Phe Val His Leu Gly His Arg Asp Ser Leu Glu
                245                 250                 255

ggc gac ctc ctc aac cgg aac aac acc ttc aag ccc ttt gcg gag tac   817
Gly Asp Leu Leu Asn Arg Asn Asn Thr Phe Lys Pro Phe Ala Glu Tyr
            260                 265                 270

aaa tcg gac tac gtc tac gag cca ttc ccc aag agc gtg tgg gag cag   865
Lys Ser Asp Tyr Val Tyr Glu Pro Phe Pro Lys Ser Val Trp Glu Gln
        275                 280                 285

atc ttc ggc acc tgg ctc gtg aag cct ggt gcg ggg att atg atc ttt   913
Ile Phe Gly Thr Trp Leu Val Lys Pro Gly Ala Gly Ile Met Ile Phe
    290                 295                 300

gac ccc tac ggt gcc acc atc agc gct acc cca gaa gcg gcg acg ccg   961
Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ala Ala Thr Pro
305                 310                 315                 320
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ttc cct cac cgc aag gga gtc ctc ttc aac atc cag tac gtc aac tac   1009
Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr Val Asn Tyr
                325                 330                 335

tgg ttc gct ccg gga gcc ggc gcc gcg ccc ttg tca tgg agc aag gaa   1057
Trp Phe Ala Pro Gly Ala Gly Ala Ala Pro Leu Ser Trp Ser Lys Glu
            340                 345                 350

atc tac aac tac atg gag ccg tac gtg agc aag aac ccc agg cag gcc   1105
Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro Arg Gln Ala
        355                 360                 365

tac gcc aac tac agg gac atc gac ctc ggg agg aac gag gtg gtg aat   1153
Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu Val Val Asn
    370                 375                 380

ggc gtc tcc acc tac agc agt ggt aag gtc tgg gga cag aaa tat ttc   1201
Gly Val Ser Thr Tyr Ser Ser Gly Lys Val Trp Gly Gln Lys Tyr Phe
385                 390                 395                 400

aag ggt aac ttc gag agg ctc gcc att acc aag ggc aag gtg gat cct   1249
Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys Val Asp Pro
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acg gat tac ttc agg aac gag ca                                   1272
Thr Asp Tyr Phe Arg Asn Glu
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             20                  25                  30

Asn Phe Ala Val Val Asp Leu Asn Gln Met Arg Ala Val Leu Val Asp
         35                  40                  45

Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln Leu Gly Glu
     50                  55                  60

Leu Tyr Tyr Ala Ile Ser Lys Tyr Ser Arg Thr Leu Ala Phe Pro Ala
 65                  70                  75                  80

Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Leu Ala Gly Gly Gly
                 85                  90                  95

Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu Asn Val Ile
            100                 105                 110

Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp Lys Lys Ser
        115                 120                 125
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Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly Gly Glu Ser
    130                 135                 140

Phe Gly Ile Val Val Ser Trp Gln Val Lys Leu Leu Pro Val Pro Pro
145                 150                 155                 160

Thr Val Thr Ile Phe Lys Ile Pro Lys Ser Val Ser Glu Gly Ala Val
                165                 170                 175

Asp Ile Ile Asn Lys Trp Gln Leu Val Ala Pro Gln Leu Pro Ala Asp
            180                 185                 190

Leu Met Ile Arg Ile Ile Ala Met Gly Pro Lys Ala Thr Phe Glu Ala
        195                 200                 205

Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Met Met Gln Ser Lys
    210                 215                 220

Phe Pro Glu Leu Gly Met Asn Ala Ser His Cys Asn Glu Met Ser Trp
225                 230                 235                 240

Ile Glu Ser Ile Pro Phe Val His Leu Gly His Arg Asp Ser Leu Glu
                245                 250                 255

Gly Asp Leu Leu Asn Arg Asn Asn Thr Phe Lys Pro Phe Ala Glu Tyr
            260                 265                 270

Lys Ser Asp Tyr Val Tyr Glu Pro Phe Pro Lys Ser Val Trp Glu Gln
        275                 280                 285

Ile Phe Gly Thr Trp Leu Val Lys Pro Gly Ala Gly Ile Met Ile Phe
    290                 295                 300

Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ala Ala Thr Pro
305                 310                 315                 320

Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr Val Asn Tyr
                325                 330                 335

Trp Phe Ala Pro Gly Ala Gly Ala Ala Pro Leu Ser Trp Ser Lys Glu
            340                 345                 350

Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro Arg Gln Ala
        355                 360                 365

Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu Val Val Asn
    370                 375                 380

Gly Val Ser Thr Tyr Ser Ser Gly Lys Val Trp Gly Gln Lys Tyr Phe
385                 390                 395                 400

Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys Val Asp Pro
                405                 410                 415

Thr Asp Tyr Phe Arg Asn Glu
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  1               5                  10                  15

aaa gaa atc ccg ccg cgt ctg ttg tac gcg aaa tcg tcg ccg gcg tat   96
Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
            20                  25                  30

ccc tca gtc ctg ggg cag acc atc cgg aac tcg agg tgg tcg tcg ccg   144
Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
        35                  40                  45

gac aac gtg aag ccg ctc tac atc atc acc ccc acc aac gtc tcc cac   192
Asp Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr Asn Val Ser His
    50                  55                  60

atc cag tct gcc gtg gtg tgc ggc cgc cgt tac gac gtc cgc atc cgc   240
Ile Gln Ser Ala Val Val Cys Gly Arg Arg Tyr Asp Val Arg Ile Arg
65                  70                  75                  80

gta cgc agc ggc ggg cac gac tac gag ggc ctc tcg tac cgc tcc ctg   288
Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu
                85                  90                  95

cag ccc gag aac ttc gca gtc gtc gac ctc aac cag atg cgg gcg gtg   336
Gln Pro Glu Asn Phe Ala Val Val Asp Leu Asn Gln Met Arg Ala Val
            100                 105                 110

ttg gtg gac ggt aag gcc cgc acg gcg tgg gtc gac tcc ggc gcg cag   384
Leu Val Asp Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln
        115                 120                 125

ctc ggc gag ctc tac tac gcc atc tcc aag tat agc cgc acg ctg gcc   432
Leu Gly Glu Leu Tyr Tyr Ala Ile Ser Lys Tyr Ser Arg Thr Leu Ala
    130                 135                 140

ttc ccg gca ggc gtt tgc ccg acc atc ggc gtg ggc ggc aac ctc gcg   480
Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Leu Ala
145                 150                 155                 160

ggc ggc ggc ttc ggt atg ctg ctg cgc aag tac ggc atc gcc gca gag   528
Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu
                165                 170                 175
```

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aac gtc atc gac gtg aag ctc gtc gac gcc aac ggc aag ctg cac gac   576
Asn Val Ile Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp
            180                 185                 190

aag aag tcc atg ggc gac gac cat ttc tgg gcc gtg agg ggt ggc ggc   624
Lys Lys Ser Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly
        195                 200                 205

ggc gag agc ttc ggc atc gtg gtc tcg tgg cag gtg aag ctc ctg ccg   672
Gly Glu Ser Phe Gly Ile Val Val Ser Trp Gln Val Lys Leu Leu Pro
    210                 215                 220

gtg cct ccc acg gtg acc atc ttc aag atc ccc aag tca gtc agc gag   720
Val Pro Pro Thr Val Thr Ile Phe Lys Ile Pro Lys Ser Val Ser Glu
225                 230                 235                 240

ggc gcc gtg gac atc atc aac aag tgg caa ctg gtc gcg cct caa ctt   768
Gly Ala Val Asp Ile Ile Asn Lys Trp Gln Leu Val Ala Pro Gln Leu
                245                 250                 255

ccc gcc gac ctc atg atc cgc atc att gcg atg ggg ccc aag gcc acg   816
Pro Ala Asp Leu Met Ile Arg Ile Ile Ala Met Gly Pro Lys Ala Thr
            260                 265                 270

ttc gag gcc atg tac ctc ggc acc tgc aaa acc ctg acg ccg atg atg   864
Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Met Met
        275                 280                 285

cag agc aag ttc ccc gag ctt ggc atg aac gcc tcg cac tgc aac gag   912
Gln Ser Lys Phe Pro Glu Leu Gly Met Asn Ala Ser His Cys Asn Glu
    290                 295                 300

atg tca tgg atc gag tcc atc ccc ttc gtc cac ctc ggc cat agg gat   960
Met Ser Trp Ile Glu Ser Ile Pro Phe Val His Leu Gly His Arg Asp
305                 310                 315                 320

tcc ctg gag ggc gac ctc ctc aac cgg aac aac acc ttc aag ccc ttt  1008
Ser Leu Glu Gly Asp Leu Leu Asn Arg Asn Asn Thr Phe Lys Pro Phe
                325                 330                 335

gcg gag tac aaa tcg gac tac gtc tac gag cca ttc ccc aag agc gtg  1056
Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Glu Pro Phe Pro Lys Ser Val
            340                 345                 350

tgg gag cag atc ttc ggc acc tgg ctc gtg aag cct ggt gcg ggg att  1104
Trp Glu Gln Ile Phe Gly Thr Trp Leu Val Lys Pro Gly Ala Gly Ile
        355                 360                 365

atg atc ttt gac ccc tac ggt gcc acc atc agc gct acc cca gaa gcg  1152
Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ala
    370                 375                 380

gcg acg ccg ttc cct cac cgc aag gga gtc ctc ttc aac atc cag tac  1200
Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr
385                 390                 395                 400
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gtc aac tac tgg ttc gct ccg gga gcc ggc gcc gcg ccc ttg tca tgg   1248
Val Asn Tyr Trp Phe Ala Pro Gly Ala Gly Ala Ala Pro Leu Ser Trp
                405                 410                 415

agc aag gaa atc tac aac tac atg gag ccg tac gtg agc aag aac ccc   1296
Ser Lys Glu Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro
            420                 425                 430

agg cag gcc tac gcc aac tac agg gac atc gac ctc ggg agg aac gag   1344
Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu
        435                 440                 445

gtg gtg aat ggc gtc tcc acc tac agc agt ggt aag gtc tgg gga cag   1392
Val Val Asn Gly Val Ser Thr Tyr Ser Ser Gly Lys Val Trp Gly Gln
    450                 455                 460

aaa tat ttc aag ggt aac ttc gag agg ctc gcc att acc aag ggc aag   1440
Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys
465                 470                 475                 480

gtg gat cct acg gat tac ttc agg aac gag cag agc atc ccg ccg ctc   1488
Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu
                485                 490                 495

atc aaa aag tac tga                                              1503
Ile Lys Lys Tyr
            500
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<210> 4
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<213> Lolium perenne

<400> 4

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Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
             20                  25                  30

Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
         35                  40                  45

Asp Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr Asn Val Ser His
     50                  55                  60

Ile Gln Ser Ala Val Val Cys Gly Arg Arg Tyr Asp Val Arg Ile Arg
 65                  70                  75                  80

Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu
                 85                  90                  95

Gln Pro Glu Asn Phe Ala Val Val Asp Leu Asn Gln Met Arg Ala Val
            100                 105                 110

Leu Val Asp Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln
        115                 120                 125
```

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Leu Gly Glu Leu Tyr Tyr Ala Ile Ser Lys Tyr Ser Arg Thr Leu Ala
    130                 135                 140

Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Leu Ala
145                 150                 155                 160

Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu
                165                 170                 175

Asn Val Ile Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp
            180                 185                 190

Lys Lys Ser Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly
        195                 200                 205

Gly Glu Ser Phe Gly Ile Val Val Ser Trp Gln Val Lys Leu Leu Pro
    210                 215                 220

Val Pro Pro Thr Val Thr Ile Phe Lys Ile Pro Lys Ser Val Ser Glu
225                 230                 235                 240

Gly Ala Val Asp Ile Ile Asn Lys Trp Gln Leu Val Ala Pro Gln Leu
                245                 250                 255

Pro Ala Asp Leu Met Ile Arg Ile Ile Ala Met Gly Pro Lys Ala Thr
            260                 265                 270

Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Met Met
        275                 280                 285

Gln Ser Lys Phe Pro Glu Leu Gly Met Asn Ala Ser His Cys Asn Glu
    290                 295                 300

Met Ser Trp Ile Glu Ser Ile Pro Phe Val His Leu Gly His Arg Asp
305                 310                 315                 320

Ser Leu Glu Gly Asp Leu Leu Asn Arg Asn Asn Thr Phe Lys Pro Phe
                325                 330                 335

Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Glu Pro Phe Pro Lys Ser Val
            340                 345                 350

Trp Glu Gln Ile Phe Gly Thr Trp Leu Val Lys Pro Gly Ala Gly Ile
        355                 360                 365

Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ala
    370                 375                 380

Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr
385                 390                 395                 400

Val Asn Tyr Trp Phe Ala Pro Gly Ala Gly Ala Ala Pro Leu Ser Trp
                405                 410                 415

Ser Lys Glu Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro
            420                 425                 430
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Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu
        435                 440                 445

Val Val Asn Gly Val Ser Thr Tyr Ser Ser Gly Lys Val Trp Gly Gln
    450                 455                 460

Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys
465                 470                 475                 480

Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu
                485                 490                 495

Ile Lys Lys Tyr
            500
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<212> DNA
<213> Phleum pratense

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<222> (1)..(1503)

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Tyr Phe Pro Pro Pro Ala Ala Lys Glu Asp Phe Leu Gly Cys Leu Val
  1               5                  10                  15

aaa gaa atc ccg ccg cgt ctg ttg tac gcg aaa tcg tcg ccg gcg tat   96
Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
             20                  25                  30

ccc tca gtc ctg ggg cag acc atc cgg aac tcg agg tgg tcg tcg ccg   144
Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
         35                  40                  45

gac aac gtg aag ccg ctc tac atc atc acc ccc acc aac gtc tcc cac   192
Asp Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr Asn Val Ser His
     50                  55                  60

atc cag tcc gcc gtg gtg tgc ggc cgc cgc cac agc gtc cgc atc cgc   240
Ile Gln Ser Ala Val Val Cys Gly Arg Arg His Ser Val Arg Ile Arg
 65                  70                  75                  80

gtg cgc agc ggc ggg cac gac tac gag ggc ctc tcg tac cgg tct ttg   288
Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu
                 85                  90                  95

cag ccc gag acg ttc gcc gtc gtc gac ctc aac aag atg cgg gcg gtg   336
Gln Pro Glu Thr Phe Ala Val Val Asp Leu Asn Lys Met Arg Ala Val
            100                 105                 110

tgg gtg gac ggc aag gcc cgc acg gcg tgg gtg gac tcc ggc gcg cag   384
Trp Val Asp Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln
        115                 120                 125
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```
ctc ggc gag ctc tac tac gcc atc tat aag gcg agc ccc acg ctg gcg   432
Leu Gly Glu Leu Tyr Tyr Ala Ile Tyr Lys Ala Ser Pro Thr Leu Ala
    130                 135                 140

ttc ccg gcc ggc gtg tgc ccg acg atc gga gtg ggc ggc aac ttc gcg   480
Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Phe Ala
145                 150                 155                 160

ggc ggc ggc ttc ggc atg ctg ctg cgc aag tac ggc atc gcc gcg gag   528
Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu
                165                 170                 175

aac gtc atc gac gtg aag ctc gtc gac gcc aac ggc aag ctg cac gac   576
Asn Val Ile Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp
            180                 185                 190

aag aag tcc atg ggc gac gac cat ttc tgg gcc gtc agg ggc ggc ggg   624
Lys Lys Ser Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly
        195                 200                 205

ggc gag agc ttc ggc atc gtg gtc gcg tgg cag gtg aag ctc ctg ccg   672
Gly Glu Ser Phe Gly Ile Val Val Ala Trp Gln Val Lys Leu Leu Pro
    210                 215                 220

gtg ccg ccc acc gtg aca ata ttc aag atc tcc aag aca gtg agc gag   720
Val Pro Pro Thr Val Thr Ile Phe Lys Ile Ser Lys Thr Val Ser Glu
225                 230                 235                 240

ggc gcc gtg gac atc atc aac aag tgg caa gtg gtc gcg ccg cag ctt   768
Gly Ala Val Asp Ile Ile Asn Lys Trp Gln Val Val Ala Pro Gln Leu
                245                 250                 255

ccc gcc gac ctc atg atc cgc atc atc gcg cag ggg ccc aag gcc acg   816
Pro Ala Asp Leu Met Ile Arg Ile Ile Ala Gln Gly Pro Lys Ala Thr
            260                 265                 270

ttc gag gcc atg tac ctc ggc acc tgc aaa acc ctg acg ccg ttg atg   864
Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Leu Met
        275                 280                 285

agc agc aag ttc ccg gag ctc ggc atg aac ccc tcc cac tgc aac gag   912
Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro Ser His Cys Asn Glu
    290                 295                 300

atg tca tgg atc cag tcc atc ccc ttc gtc cac ctc ggc cac agg gac   960
Met Ser Trp Ile Gln Ser Ile Pro Phe Val His Leu Gly His Arg Asp
305                 310                 315                 320

gcc ctc gag gac gac ctc ctc aac cgg aac aac tcc ttc aag ccc ttc  1008
Ala Leu Glu Asp Asp Leu Leu Asn Arg Asn Asn Ser Phe Lys Pro Phe
                325                 330                 335

gcc gaa tac aag tcc gac tac gtc tac cag ccc ttc ccc aag acc gtc  1056
Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro Lys Thr Val
            340                 345                 350
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tgg gag cag atc ctc aac acc tgg ctc gtc aag ccc ggc gcc ggg atc   1104
Trp Glu Gln Ile Leu Asn Thr Trp Leu Val Lys Pro Gly Ala Gly Ile
        355                 360                 365

atg atc ttc gac ccc tac ggc gcc acc atc agc gcc acc ccg gag tcc   1152
Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ser
    370                 375                 380

gcc acg ccc ttc cct cac cgc aag ggc gtc ctc ttc aac atc cag tac   1200
Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr
385                 390                 395                 400

gtc aac tac tgg ttc gcc ccg gga gcc gcc gcc gcg ccc ctc tcg tgg   1248
Val Asn Tyr Trp Phe Ala Pro Gly Ala Ala Ala Ala Pro Leu Ser Trp
                405                 410                 415

agc aag gac atc tac aac tac atg gag ccc tac gtg agc aag aac ccc   1296
Ser Lys Asp Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro
            420                 425                 430

agg cag gcg tac gca aac tac agg gac atc gac ctc ggc agg aac gag   1344
Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu
        435                 440                 445

gtg gtc aac gac gtc tcc acc tac gcc agc ggc aag gtc tgg ggc cag   1392
Val Val Asn Asp Val Ser Thr Tyr Ala Ser Gly Lys Val Trp Gly Gln
    450                 455                 460

aaa tac ttc aag ggc aac ttc gag agg ctc gcc att acc aag ggc aag   1440
Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys
465                 470                 475                 480

gtc gat cct acc gac tac ttc agg aac gag cag agc atc ccg ccg ctc   1488
Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu
                485                 490                 495

atc aaa aag tac tga                                              1503
Ile Lys Lys Tyr
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<210> 6
<211> 500
<212> PRT
<213> Phleum pratense

<400> 6

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Lys Glu Ile Pro Pro Arg Leu Leu Tyr Ala Lys Ser Ser Pro Ala Tyr
             20                  25                  30

Pro Ser Val Leu Gly Gln Thr Ile Arg Asn Ser Arg Trp Ser Ser Pro
         35                  40                  45

Asp Asn Val Lys Pro Leu Tyr Ile Ile Thr Pro Thr Asn Val Ser His
     50                  55                  60
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Ile Gln Ser Ala Val Val Cys Gly Arg Arg His Ser Val Arg Ile Arg
 65                  70                  75                  80

Val Arg Ser Gly Gly His Asp Tyr Glu Gly Leu Ser Tyr Arg Ser Leu
                 85                  90                  95

Gln Pro Glu Thr Phe Ala Val Val Asp Leu Asn Lys Met Arg Ala Val
            100                 105                 110

Trp Val Asp Gly Lys Ala Arg Thr Ala Trp Val Asp Ser Gly Ala Gln
        115                 120                 125

Leu Gly Glu Leu Tyr Tyr Ala Ile Tyr Lys Ala Ser Pro Thr Leu Ala
    130                 135                 140

Phe Pro Ala Gly Val Cys Pro Thr Ile Gly Val Gly Gly Asn Phe Ala
145                 150                 155                 160

Gly Gly Gly Phe Gly Met Leu Leu Arg Lys Tyr Gly Ile Ala Ala Glu
                165                 170                 175

Asn Val Ile Asp Val Lys Leu Val Asp Ala Asn Gly Lys Leu His Asp
            180                 185                 190

Lys Lys Ser Met Gly Asp Asp His Phe Trp Ala Val Arg Gly Gly Gly
        195                 200                 205

Gly Glu Ser Phe Gly Ile Val Val Ala Trp Gln Val Lys Leu Leu Pro
    210                 215                 220

Val Pro Pro Thr Val Thr Ile Phe Lys Ile Ser Lys Thr Val Ser Glu
225                 230                 235                 240

Gly Ala Val Asp Ile Ile Asn Lys Trp Gln Val Val Ala Pro Gln Leu
                245                 250                 255

Pro Ala Asp Leu Met Ile Arg Ile Ile Ala Gln Gly Pro Lys Ala Thr
            260                 265                 270

Phe Glu Ala Met Tyr Leu Gly Thr Cys Lys Thr Leu Thr Pro Leu Met
        275                 280                 285

Ser Ser Lys Phe Pro Glu Leu Gly Met Asn Pro Ser His Cys Asn Glu
    290                 295                 300

Met Ser Trp Ile Gln Ser Ile Pro Phe Val His Leu Gly His Arg Asp
305                 310                 315                 320

Ala Leu Glu Asp Asp Leu Leu Asn Arg Asn Asn Ser Phe Lys Pro Phe
                325                 330                 335

Ala Glu Tyr Lys Ser Asp Tyr Val Tyr Gln Pro Phe Pro Lys Thr Val
            340                 345                 350

Trp Glu Gln Ile Leu Asn Thr Trp Leu Val Lys Pro Gly Ala Gly Ile
        355                 360                 365
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Met Ile Phe Asp Pro Tyr Gly Ala Thr Ile Ser Ala Thr Pro Glu Ser
    370                 375                 380

Ala Thr Pro Phe Pro His Arg Lys Gly Val Leu Phe Asn Ile Gln Tyr
385                 390                 395                 400

Val Asn Tyr Trp Phe Ala Pro Gly Ala Ala Ala Ala Pro Leu Ser Trp
                405                 410                 415

Ser Lys Asp Ile Tyr Asn Tyr Met Glu Pro Tyr Val Ser Lys Asn Pro
            420                 425                 430

Arg Gln Ala Tyr Ala Asn Tyr Arg Asp Ile Asp Leu Gly Arg Asn Glu
        435                 440                 445

Val Val Asn Asp Val Ser Thr Tyr Ala Ser Gly Lys Val Trp Gly Gln
    450                 455                 460

Lys Tyr Phe Lys Gly Asn Phe Glu Arg Leu Ala Ile Thr Lys Gly Lys
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Val Asp Pro Thr Asp Tyr Phe Arg Asn Glu Gln Ser Ile Pro Pro Leu
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Ile Lys Lys Tyr
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Tyr

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Gly Lys Tyr

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Met Thr Pro Tyr Val Ser Lys Asn Pro Arg Gln Ala Tyr Val Asn Tyr
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Arg Asp Leu Asp
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